

Fig.2

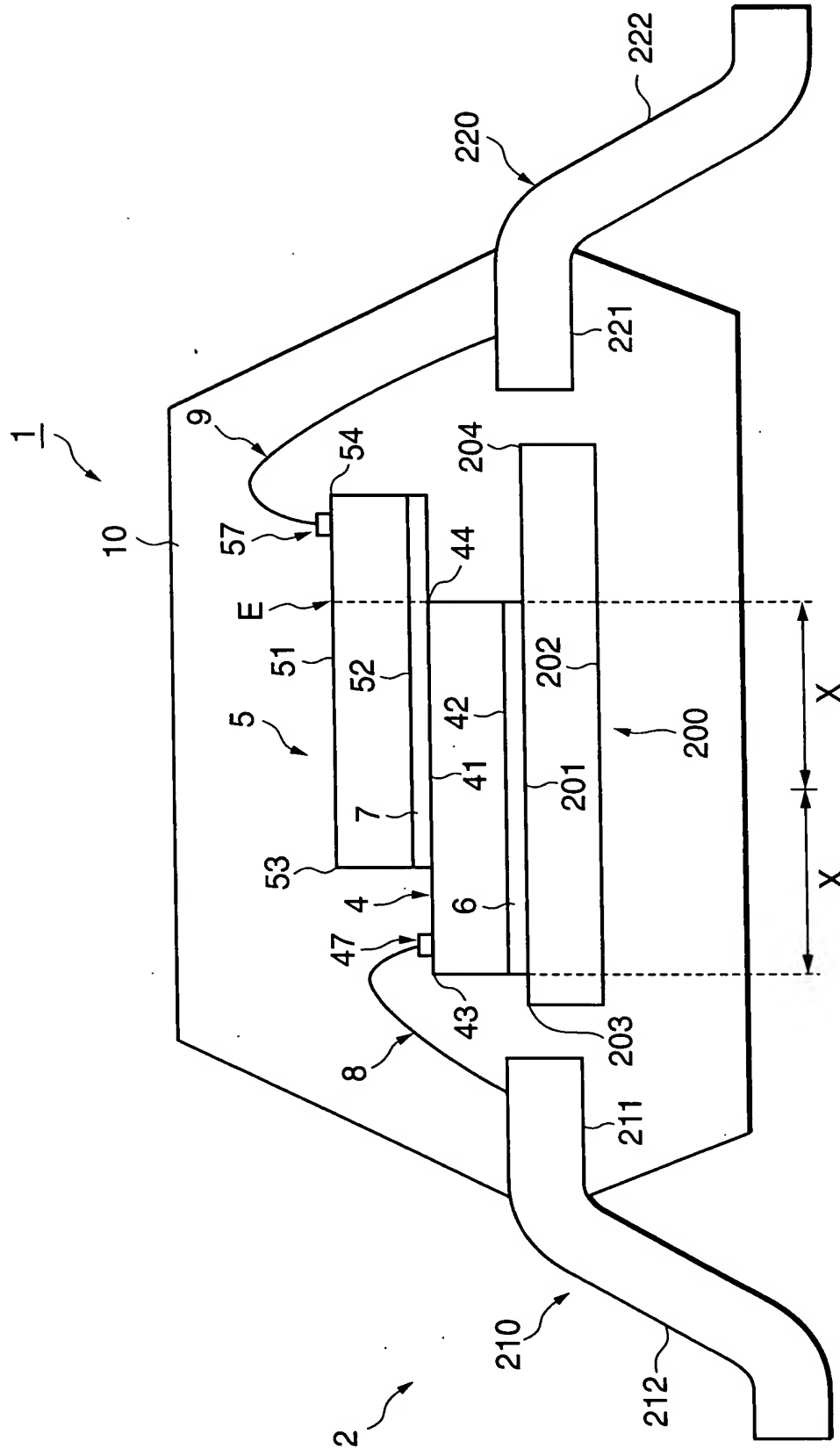
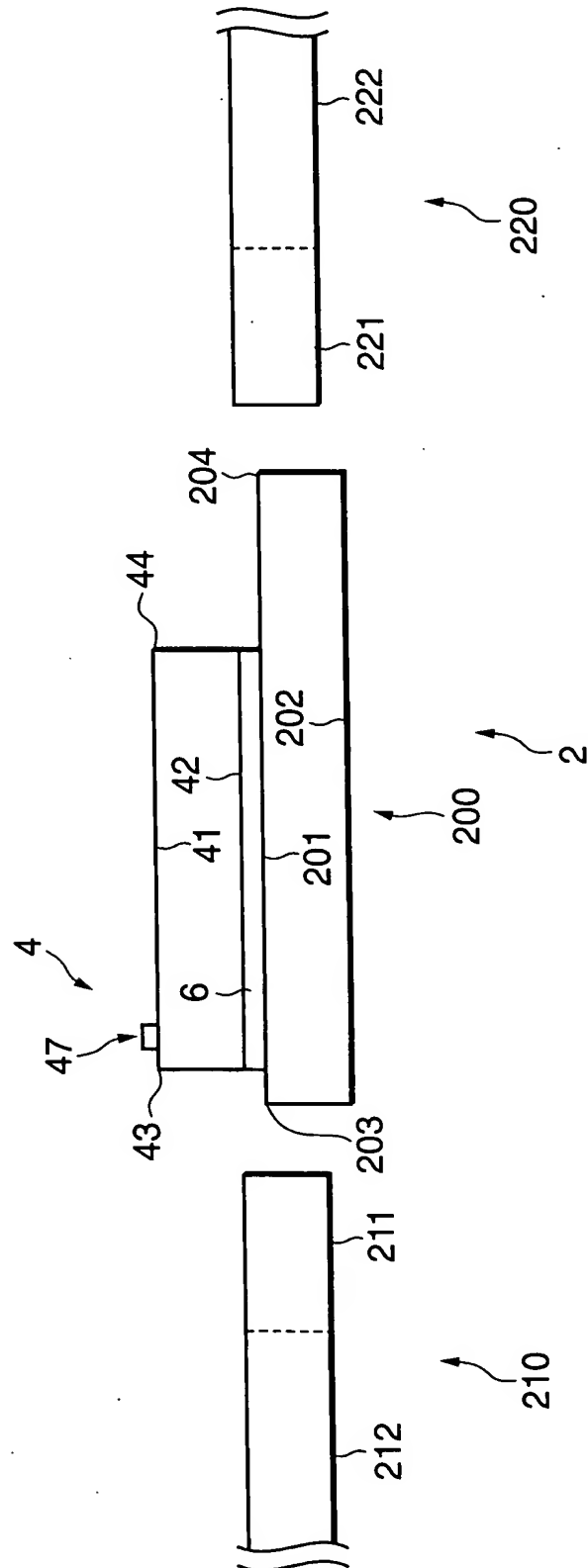
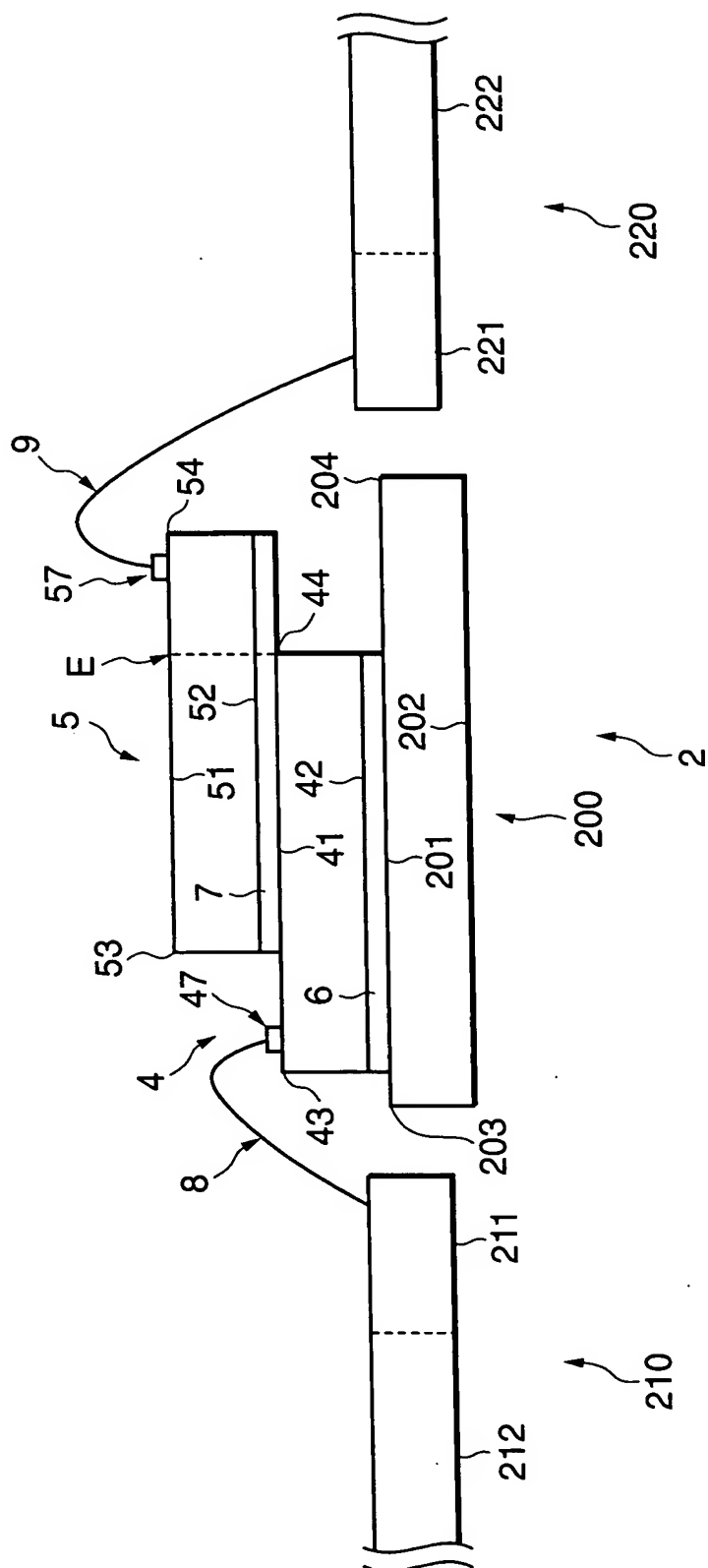
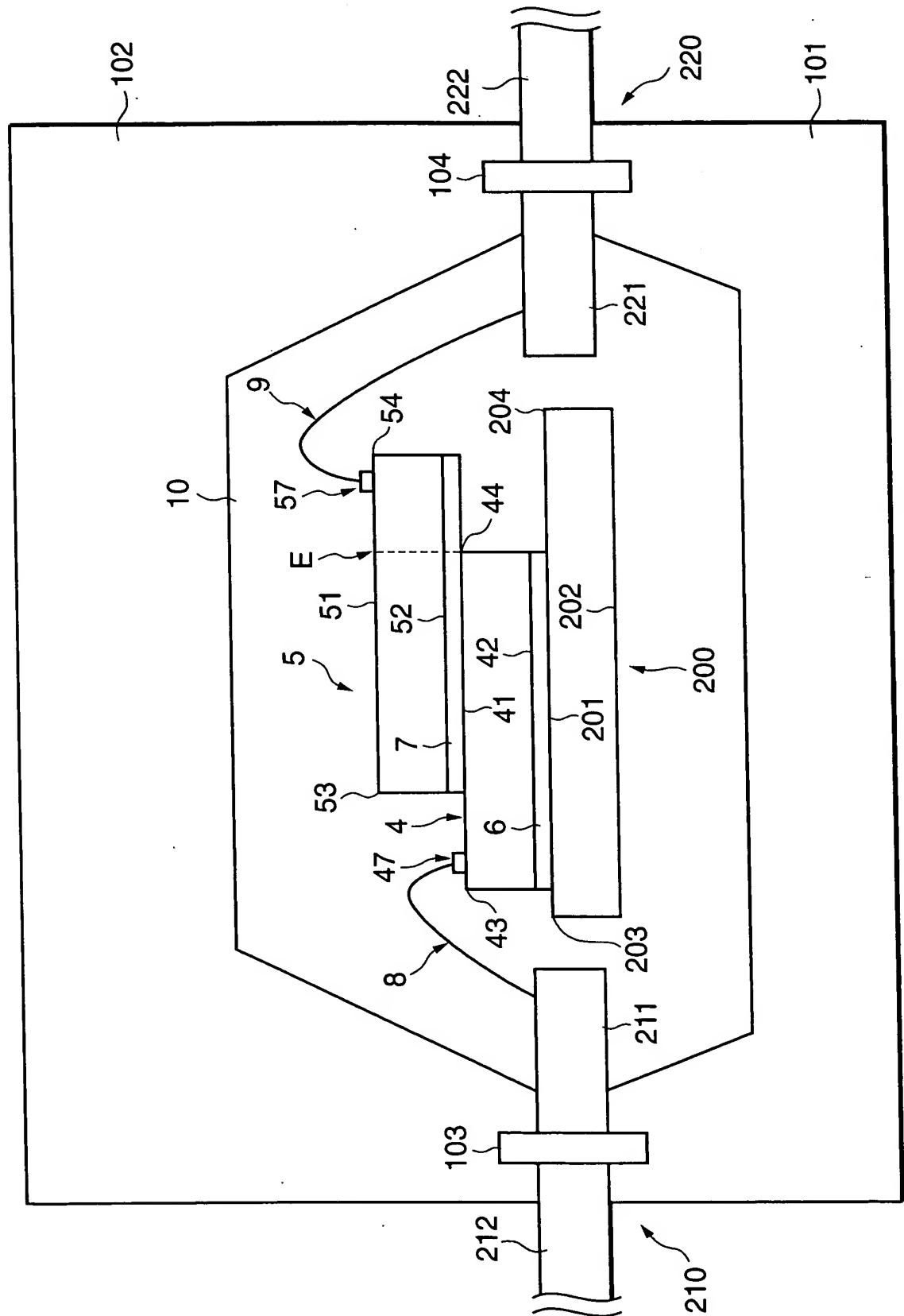


Fig.3



**Fig. 4**





[illegible]

Fig.7(a)

MATERIAL	ELASTIC MODULUS (kg/mm <sup>2</sup> )	POISSON'S RATIO
BASE MATERIAL OF SEMICONDUCTOR CHIPS	17335	0.07
LEAD FRAME	14800	0.3
RESIN ENCAPSULATING OR SEALING BODY	80	0.24
ADHESIVE	240	0.3

Fig.7(b)

THE RATIO TO LENGTH OF SEMICONDUCTOR CHIPS			
CONDITIONS ITEM	1	2	3
AMOUNT A OF DISPLACEMENT	0.1	0.2	0.3
THICKNESS B OF CHIP	0.02	0.04	0.06
HALF C OF LENGTH OF DIE PAD	0.7	1	1.3

Fig.8

NUMBER OF EXPERIMENTS	A	B	C	MAXIMUM STRESS (ALL)	MAXIMUM STRESS (EDGE PORTION)
1	1	1	1	9.1	2.6
2	1	2	2	6.9	2.9
3	1	3	3	3	1.8
4	2	1	2	9.2	1.5
5	2	2	3	7	3.1
6	2	3	1	4.6	4.4
7	3	1	3	9.2	1
8	3	2	1	6.4	5.3
9	3	3	2	4.6	3.9

MEASURE OF STRESS : kg/mm<sup>2</sup>



Fig.9(a)

LEVEL-BY-LEVEL AVERAGE OF MAXIMUM STRESS (ALL) (kg/mm <sup>2</sup> )							
A1	A2	A3	B1	B2	B3	C1	C3
6.3	6.9	6.7	9.2	6.8	4.1	6.7	6.4

Fig.9(b)

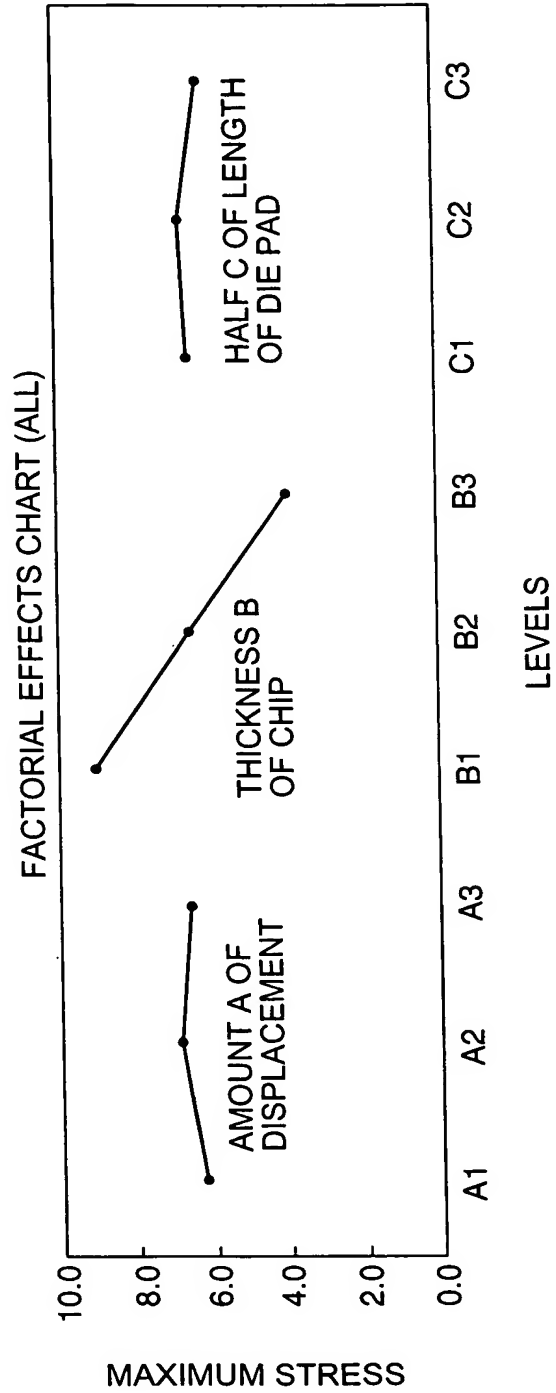


Fig.10(a)

LEVEL-BY-LEVEL AVERAGE OF MAXIMUM STRESS (EDGE PORTION) (kg/mm <sup>2</sup> )								
A1	A2	A3	B1	B2	B3	C1	C2	C3
2.4	3.0	3.4	1.7	3.8	3.4	4.1	2.8	2.0

Fig.10(b)

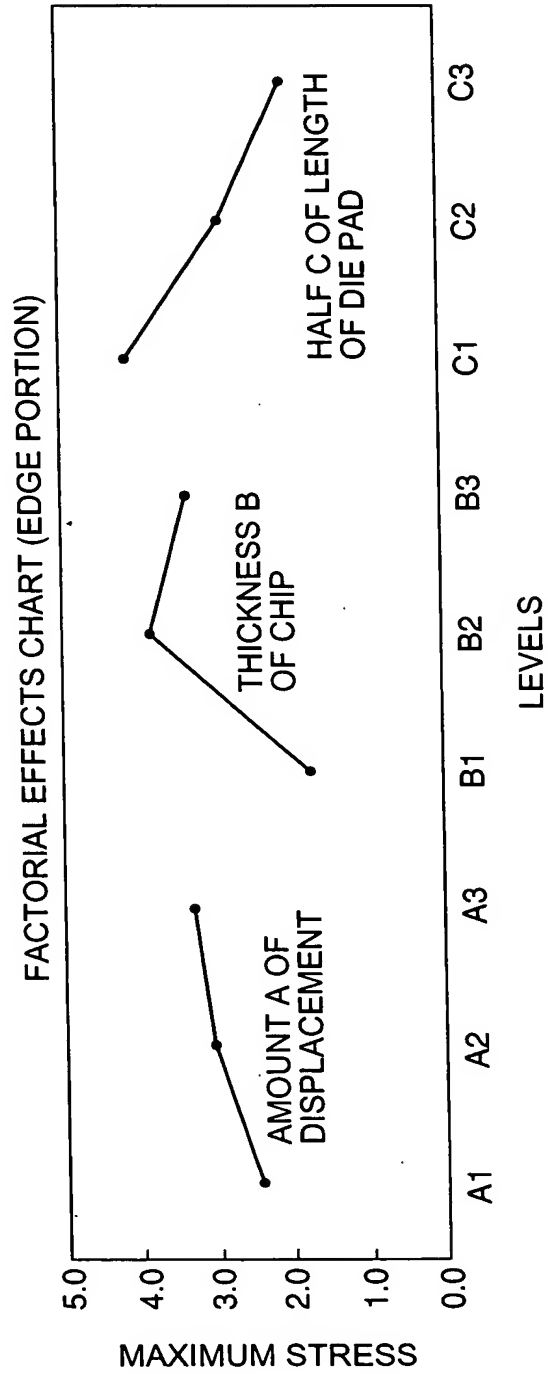
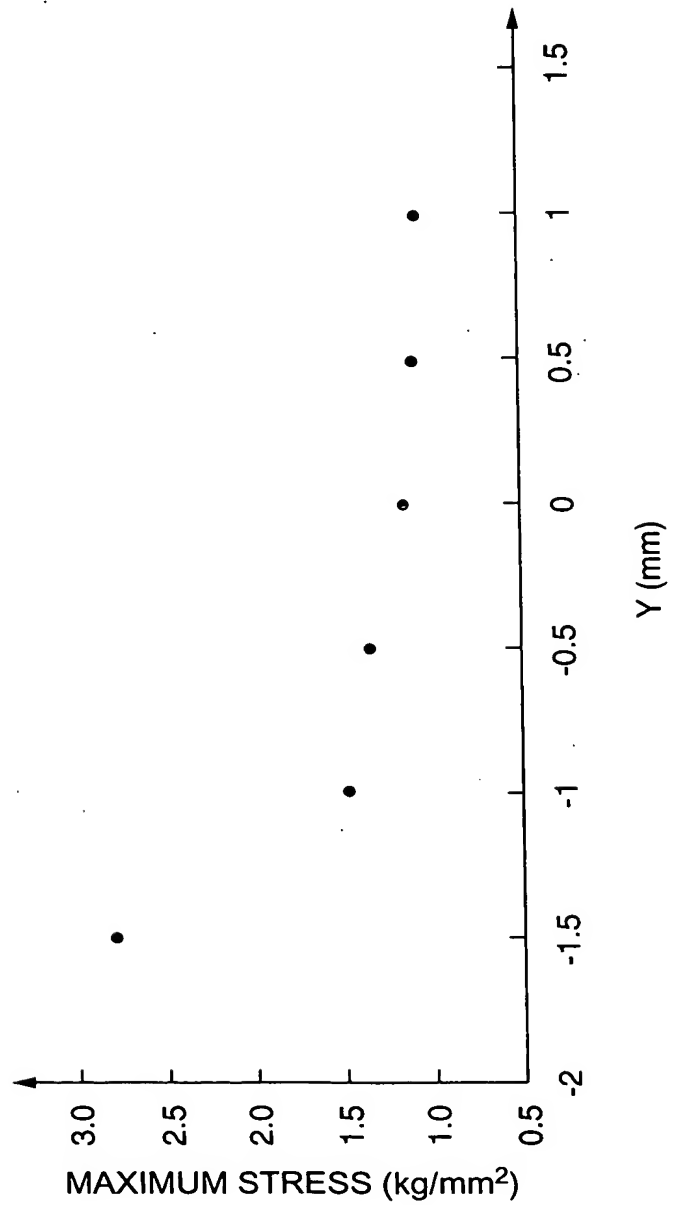


Fig.11



A cross-sectional view of a semiconductor device 1. The device features a substrate 10 with a central region 200. A first layer 201 is formed on the substrate, with a central opening 207. A second layer 202 is formed on top of the first layer. A third layer 210 is formed on the second layer, with a central opening 212. A fourth layer 211 is formed on the third layer, with a central opening 211. A fifth layer 220 is formed on the fourth layer, with a central opening 222. A sixth layer 221 is formed on the fifth layer, with a central opening 221. A seventh layer 222 is formed on the sixth layer, with a central opening 222. A eighth layer 223 is formed on the seventh layer, with a central opening 223. A ninth layer 224 is formed on the eighth layer, with a central opening 224. A tenth layer 225 is formed on the ninth layer, with a central opening 225. A eleventh layer 226 is formed on the tenth layer, with a central opening 226. A twelfth layer 227 is formed on the eleventh layer, with a central opening 227. A thirteenth layer 228 is formed on the twelfth layer, with a central opening 228. A fourteenth layer 229 is formed on the thirteenth layer, with a central opening 229. A fifteenth layer 230 is formed on the fourteenth layer, with a central opening 230. A sixteenth layer 231 is formed on the fifteenth layer, with a central opening 231. A seventeenth layer 232 is formed on the sixteenth layer, with a central opening 232. An eighteenth layer 233 is formed on the seventeenth layer, with a central opening 233. A nineteenth layer 234 is formed on the eighteenth layer, with a central opening 234. A twentieth layer 235 is formed on the nineteenth layer, with a central opening 235. A twenty-first layer 236 is formed on the twentieth layer, with a central opening 236. A twenty-second layer 237 is formed on the twenty-first layer, with a central opening 237. A twenty-third layer 238 is formed on the twenty-second layer, with a central opening 238. A twenty-fourth layer 239 is formed on the twenty-third layer, with a central opening 239. A twenty-fifth layer 240 is formed on the twenty-fourth layer, with a central opening 240. A twenty-sixth layer 241 is formed on the twenty-fifth layer, with a central opening 241. A twenty-seventh layer 242 is formed on the twenty-sixth layer, with a central opening 242. A twenty-eighth layer 243 is formed on the twenty-seventh layer, with a central opening 243. A twenty-ninth layer 244 is formed on the twenty-eighth layer, with a central opening 244. A thirtieth layer 245 is formed on the twenty-ninth layer, with a central opening 245. A thirty-first layer 246 is formed on the thirtieth layer, with a central opening 246. A thirty-second layer 247 is formed on the thirty-first layer, with a central opening 247. A thirty-third layer 248 is formed on the thirty-second layer, with a central opening 248. A thirty-fourth layer 249 is formed on the thirty-third layer, with a central opening 249. A thirty-fifth layer 250 is formed on the thirty-fourth layer, with a central opening 250. A thirty-sixth layer 251 is formed on the thirty-fifth layer, with a central opening 251. A thirty-seventh layer 252 is formed on the thirty-sixth layer, with a central opening 252. A thirty-eighth layer 253 is formed on the thirty-seventh layer, with a central opening 253. A thirty-ninth layer 254 is formed on the thirty-eighth layer, with a central opening 254. A fortieth layer 255 is formed on the thirty-ninth layer, with a central opening 255. A forty-first layer 256 is formed on the fortieth layer, with a central opening 256. A forty-second layer 257 is formed on the forty-first layer, with a central opening 257. A forty-third layer 258 is formed on the forty-second layer, with a central opening 258. A forty-fourth layer 259 is formed on the forty-third layer, with a central opening 259. A forty-fifth layer 260 is formed on the forty-fourth layer, with a central opening 260. A forty-sixth layer 261 is formed on the forty-fifth layer, with a central opening 261. A forty-seventh layer 262 is formed on the forty-sixth layer, with a central opening 262. A forty-eighth layer 263 is formed on the forty-seventh layer, with a central opening 263. A forty-ninth layer 264 is formed on the forty-eighth layer, with a central opening 264. A fiftieth layer 265 is formed on the forty-ninth layer, with a central opening 265. A fifty-first layer 266 is formed on the fiftieth layer, with a central opening 266. A fifty-second layer 267 is formed on the fifty-first layer, with a central opening 267. A fifty-third layer 268 is formed on the fifty-second layer, with a central opening 268. A fifty-fourth layer 269 is formed on the fifty-third layer, with a central opening 269. A fifty-fifth layer 270 is formed on the fifty-fourth layer, with a central opening 270. A fifty-sixth layer 271 is formed on the fifty-fifth layer, with a central opening 271. A fifty-seventh layer 272 is formed on the fifty-sixth layer, with a central opening 272. A fifty-eighth layer 273 is formed on the fifty-seventh layer, with a central opening 273. A fifty-ninth layer 274 is formed on the fifty-eighth layer, with a central opening 274. A sixtieth layer 275 is formed on the fifty-ninth layer, with a central opening 275. A sixty-first layer 276 is formed on the sixtieth layer, with a central opening 276. A sixty-second layer 277 is formed on the sixty-first layer, with a central opening 277. A sixty-third layer 278 is formed on the sixty-second layer, with a central opening 278. A sixty-fourth layer 279 is formed on the sixty-third layer, with a central opening 279. A sixty-fifth layer 280 is formed on the sixty-fourth layer, with a central opening 280. A sixty-sixth layer 281 is formed on the sixty-fifth layer, with a central opening 281. A sixty-seventh layer 282 is formed on the sixty-sixth layer, with a central opening 282. A sixty-eighth layer 283 is formed on the sixty-seventh layer, with a central opening 283. A sixty-ninth layer 284 is formed on the sixty-eighth layer, with a central opening 284. A seventieth layer 285 is formed on the sixty-ninth layer, with a central opening 285. A seventy-first layer 286 is formed on the seventieth layer, with a central opening 286. A seventy-second layer 287 is formed on the seventy-first layer, with a central opening 287. A seventy-third layer 288 is formed on the seventy-second layer, with a central opening 288. A seventy-fourth layer 289 is formed on the seventy-third layer, with a central opening 289. A seventy-fifth layer 290 is formed on the seventy-fourth layer, with a central opening 290. A seventy-sixth layer 291 is formed on the seventy-fifth layer, with a central opening 291. A seventy-seventh layer 292 is formed on the seventy-sixth layer, with a central opening 292. A seventy-eighth layer 293 is formed on the seventy-seventh layer, with a central opening 293. A seventy-ninth layer 294 is formed on the seventy-eighth layer, with a central opening 294. An eightieth layer 295 is formed on the seventy-ninth layer, with a central opening 295. An eighty-first layer 296 is formed on the eightieth layer, with a central opening 296. An eighty-second layer 297 is formed on the eighty-first layer, with a central opening 297. An eighty-third layer 298 is formed on the eighty-second layer, with a central opening 298. An eighty-fourth layer 299 is formed on the eighty-third layer, with a central opening 299. An eighty-fifth layer 300 is formed on the eighty-fourth layer, with a central opening 300. An eighty-sixth layer 301 is formed on the eighty-fifth layer, with a central opening 301. An eighty-seventh layer 302 is formed on the eighty-sixth layer, with a central opening 302. An eighty-eighth layer 303 is formed on the eighty-seventh layer, with a central opening 303. An eighty-ninth layer 304 is formed on the eighty-eighth layer, with a central opening 304. A ninetieth layer 305 is formed on the eighty-ninth layer, with a central opening 305. A hundredth layer 306 is formed on the ninetieth layer, with a central opening 306. A hundred and first layer 307 is formed on the hundredth layer, with a central opening 307. A hundred and second layer 308 is formed on the hundred and first layer, with a central opening 308. A hundred and third layer 309 is formed on the hundred and second layer, with a central opening 309. A hundred and fourth layer 310 is formed on the hundred and third layer, with a central opening 310. A hundred and fifth layer 311 is formed on the hundred and fourth layer, with a central opening 311. A hundred and sixth layer 312 is formed on the hundred and fifth layer, with a central opening 312. A hundred and seventh layer 313 is formed on the hundred and sixth layer, with a central opening 313. A hundred and eighth layer 314 is formed on the hundred and seventh layer, with a central opening 314. A hundred and ninth layer 315 is formed on the hundred and eighth layer, with a central opening 315. A hundred and tenth layer 316 is formed on the hundred and ninth layer, with a central opening 316. A hundred and eleventh layer 317 is formed on the hundred and tenth layer, with a central opening 317. A hundred and twelfth layer 318 is formed on the hundred and eleventh layer, with a central opening 318. A hundred and thirteenth layer 319 is formed on the hundred and twelfth layer, with a central opening 319. A hundred and fourteenth layer 320 is formed on the hundred and thirteenth layer, with a central opening 320. A hundred and fifteenth layer 321 is formed on the hundred and fourteenth layer, with a central opening 321. A hundred and sixteenth layer 322 is formed on the hundred and fifteenth layer, with a central opening 322. A hundred and seventeenth layer 323 is formed on the hundred and sixteenth layer, with a central opening 323. A hundred and eighteenth layer 324 is formed on the hundred and seventeenth layer, with a central opening 324. A hundred and nineteenth layer 325 is formed on the hundred and eighteenth layer, with a central opening 325. A hundred and twentieth layer 326 is formed on the hundred and nineteenth layer, with a central opening 326. A hundred and twenty-first layer 327 is formed on the hundred and twentieth layer, with a central opening 327. A hundred and twenty-second layer 328 is formed on the hundred and twenty-first layer, with a central opening 328. A hundred and twenty-third layer 329 is formed on the hundred and twenty-second layer, with a central opening 329. A hundred and twenty-fourth layer 330 is formed on the hundred and twenty-third layer, with a central opening 330. A hundred and twenty-fifth layer 331 is formed on the hundred and twenty-fourth layer, with a central opening 331. A hundred and twenty-sixth layer 332 is formed on the hundred and twenty-fifth layer, with a central opening 332. A hundred and twenty-seventh layer 333 is formed on the hundred and twenty-sixth layer, with a central opening 333. A hundred and twenty-eighth layer 334 is formed on the hundred and twenty-seventh layer, with a central opening 334. A hundred and twenty-ninth layer 335 is formed on the hundred and twenty-eighth layer, with a central opening 335. A hundred and thirtieth layer 336 is formed on the hundred and twenty-ninth layer, with a central opening 336. A hundred and thirty-first layer 337 is formed on the hundred and thirtieth layer, with a central opening 337. A hundred and thirty-second layer 338 is formed on the hundred and thirty-first layer, with a central opening 338. A hundred and thirty-third layer 339 is formed on the hundred and thirty-second layer, with a central opening 339. A hundred and thirty-fourth layer 340 is formed on the hundred and thirty-third layer, with a central opening 340. A hundred and thirty-fifth layer 341 is formed on the hundred and thirty-fourth layer, with a central opening 341. A hundred and thirty-sixth layer 342 is formed on the hundred and thirty-fifth layer, with a central opening 342. A hundred and thirty-seventh layer 343 is formed on the hundred and thirty-sixth layer, with a central opening 343. A hundred and thirty-eighth layer 344 is formed on the hundred and thirty-seventh layer, with a central opening 344. A hundred and thirty-ninth layer 345 is formed on the hundred and thirty-eighth layer, with a central opening 345. A hundred and fortieth layer 346 is formed on the hundred and thirty-ninth layer, with a central opening 346. A hundred and forty-first layer 347 is formed on the hundred and fortieth layer, with a central opening 347. A hundred and forty-second layer 348 is formed on the hundred and forty-first layer, with a central opening 348. A hundred and forty-third layer 349 is formed on the hundred and forty-second layer, with a central opening 349. A hundred and forty-fourth layer 350 is formed on the hundred and forty-third layer, with a central opening 350. A hundred and forty-fifth layer 351 is formed on the hundred and forty-fourth layer, with a central opening 351. A hundred and forty-sixth layer 352 is formed on the hundred and forty-fifth layer, with a central opening 352. A hundred and forty-seventh layer 353 is formed on the hundred and forty-sixth layer, with a central opening 353. A hundred and forty-eighth layer 354 is formed on the hundred and forty-seventh layer, with a central opening 354. A hundred and forty-ninth layer 355 is formed on the hundred and forty-eighth layer, with a central opening 355. A hundred and fiftieth layer 356 is formed on the hundred and forty-ninth layer, with a central opening 356. A hundred and fifty-first layer 357 is formed on the hundred and fiftieth layer, with a central opening 357. A hundred and fifty-second layer 358 is formed on the hundred and fifty-first layer, with a central opening 358. A hundred and fifty-third layer 359 is formed on the hundred and fifty-second layer, with a central opening 359. A hundred and fifty-fourth layer 360 is formed on the hundred and fifty-third layer, with a central opening 360. A hundred and fifty-fifth layer 361 is formed on the hundred and fifty-fourth layer, with a central opening 361. A hundred and fifty-sixth layer 362 is formed on the hundred and fifty-fifth layer, with a central opening 362. A hundred and fifty-seventh layer 363 is formed on the hundred and fifty-sixth layer, with a central opening 363. A hundred and fifty-eighth layer 364 is formed on the hundred and fifty-seventh layer, with a central opening 364. A

[illegible]

Fig.13

SHAPE OF DIE PAD SECTION	STRESS (kg/mm <sup>2</sup> )
SLITS	4.0
NO SLIT	0.1

Fig.14(b)

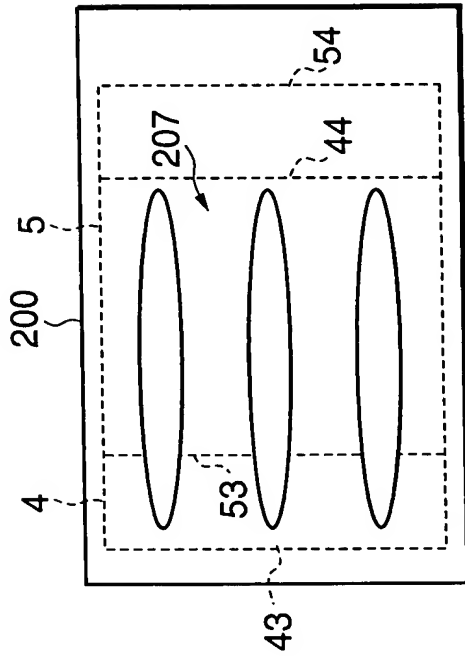


Fig.14(d)

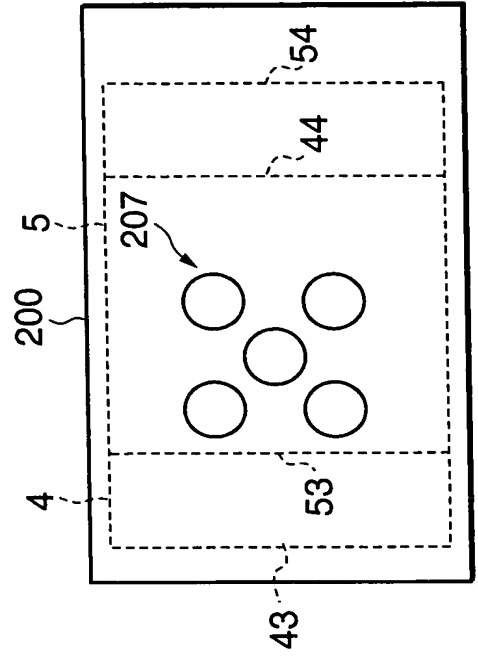


Fig.14(a)

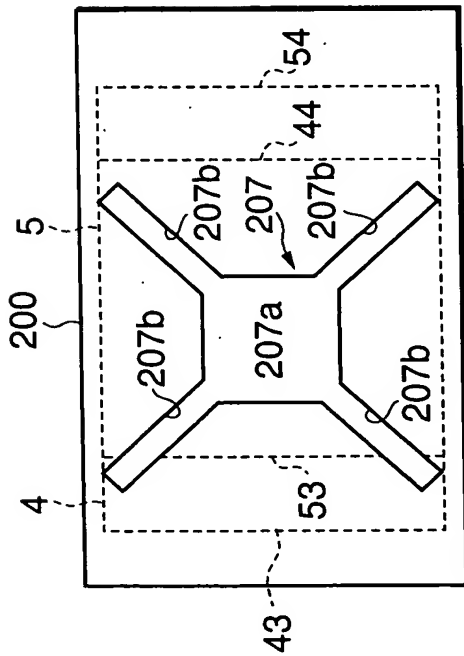
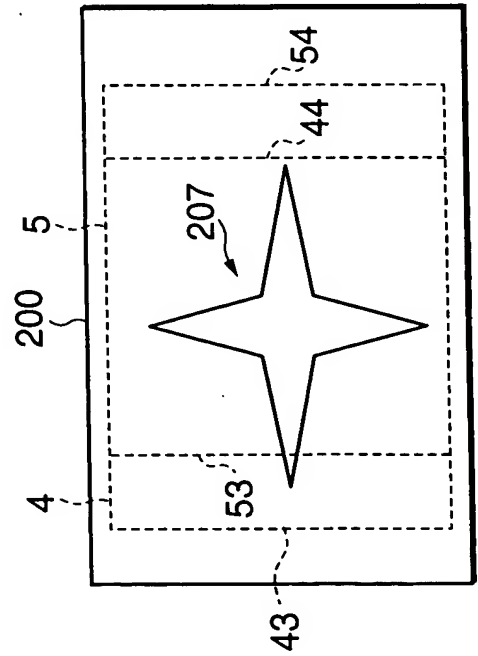
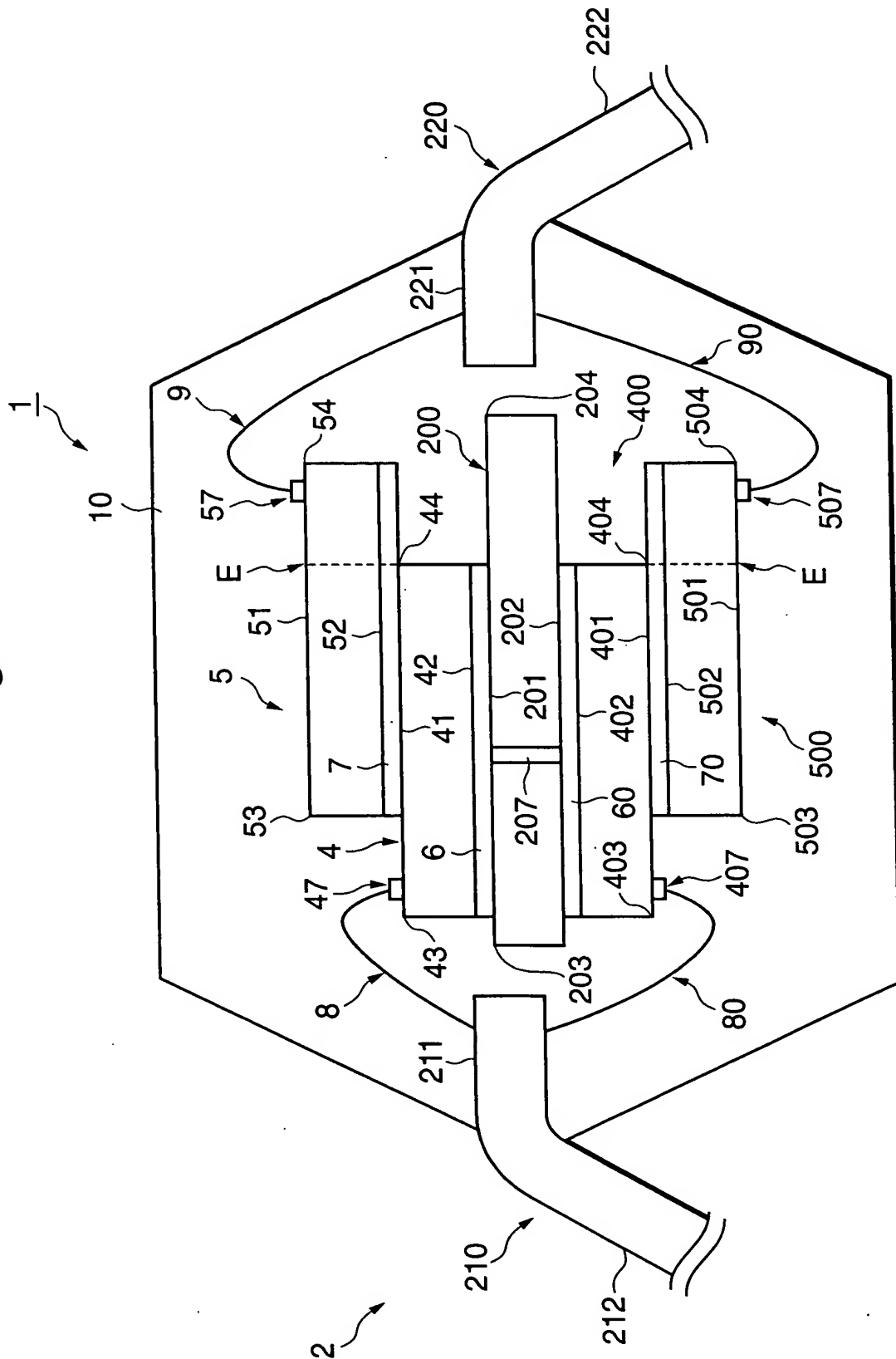


Fig.14(c)



**Fig. 15**



**Fig. 16**

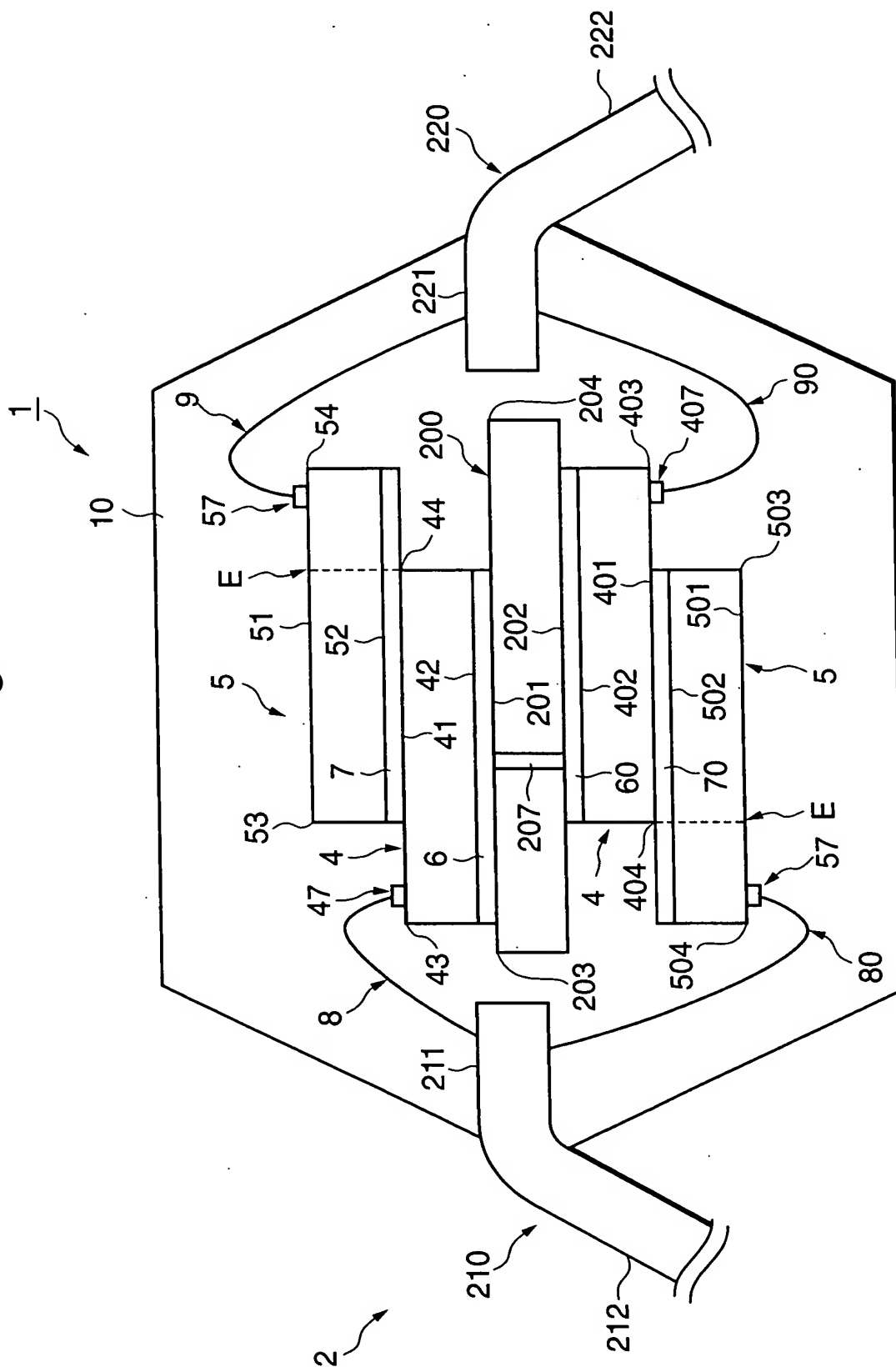




Fig.17

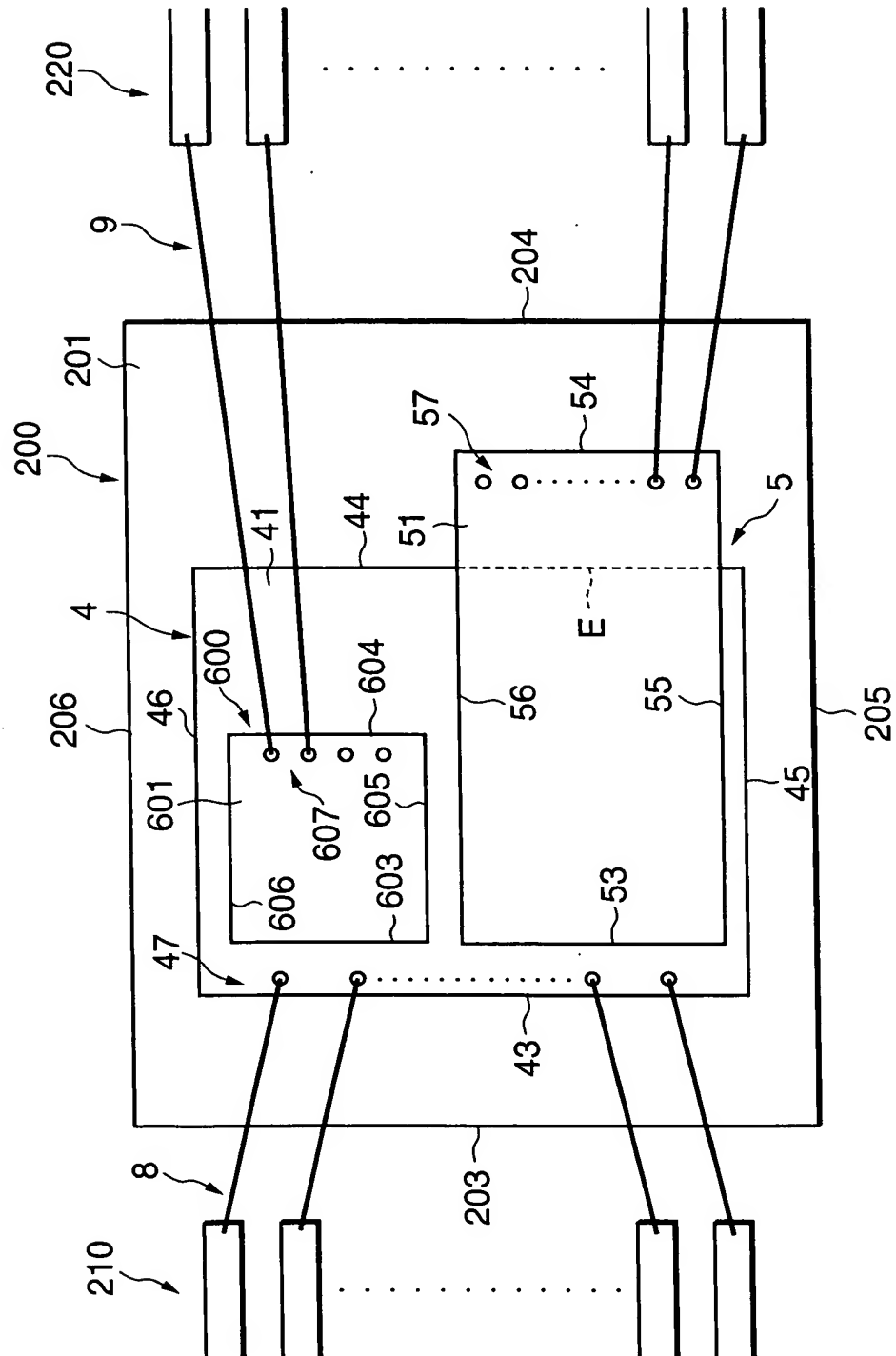


Fig.18

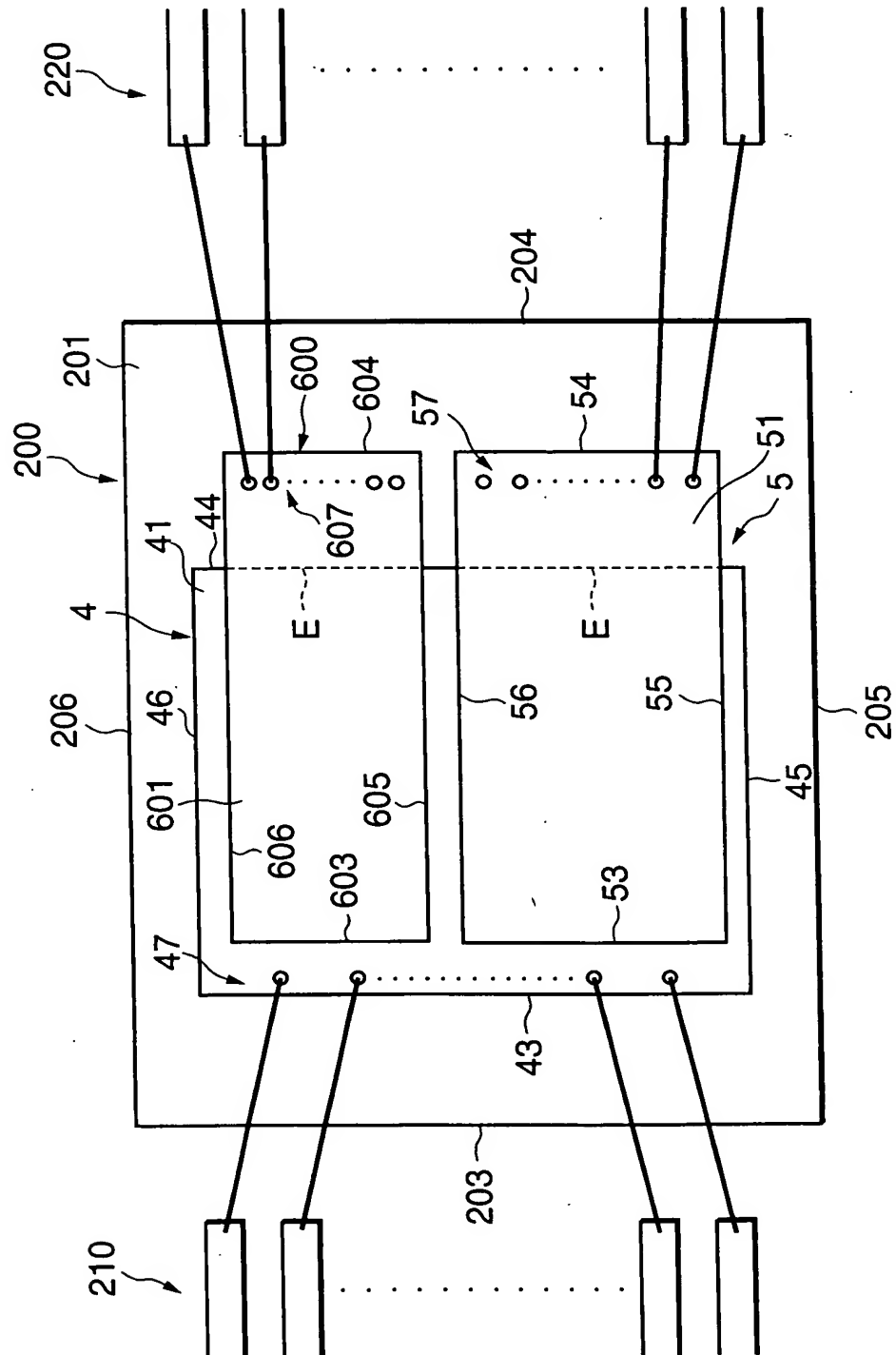


Fig.19

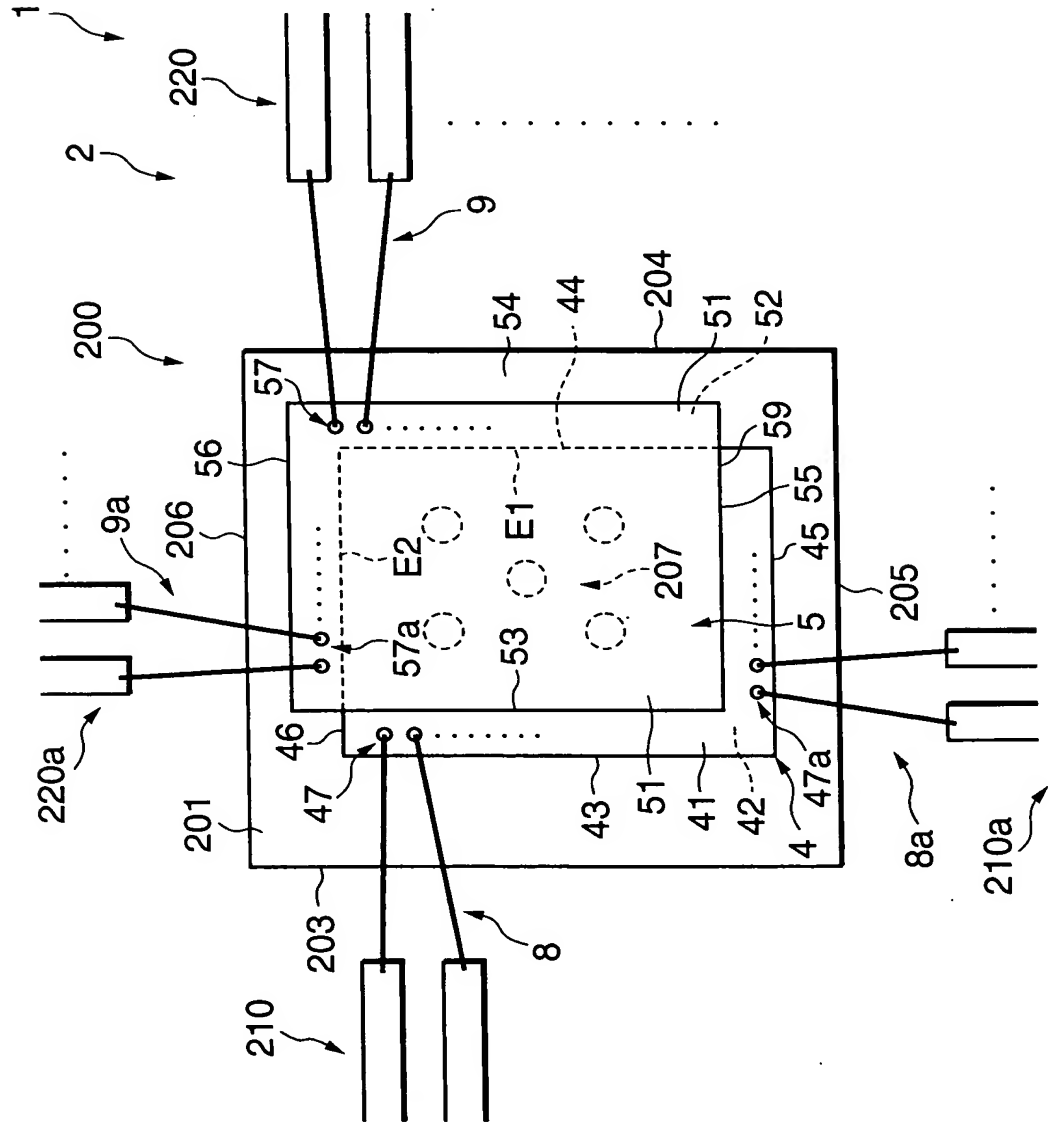


Fig.20

